

exceeding a restriction of the wavelength of light. By using the light probe microscope, it is possible to observe an optical picture with a resolving power exceeding an optical image which has been measured by using a conventional optical microscope and a highly sensitized camera and, at the same time, a surface shape can be observed as well.--

Please replace the paragraph beginning at page 1, line 19, with the following rewritten paragraph:

--In the light probe microscope, it is necessary to detect a weak light such as scattered light and fluorescent light radiated from the sample surface adjoining the light field locally existing at the probe tip. However, in the conventional light probe microscope, there are used a photomultiplier and an avalanche photodiode as a light detector.--

Please replace the paragraph beginning at page 2, line 3, with the following rewritten paragraph:

--Since a feeble light is detected in the light probe microscope, stray light is picked up in the photomultiplier whose light-intercepting face is large, so that noise becomes high. For example, where light from a

probe having an optical aperture of 100 nm is converged by an objective lens having a magnification of 100 times, a size corresponding to the aperture becomes 10 μm in a primary picture. In contrast to this, a size of the light-intercepting face of the photomultiplier is several mm to several tens of mm, so that a major region does not contribute to detection, reacts with the stray light, and becomes a source of a dark count noise. In order to eliminate the stray light, it has been considered to insert a pin hole to an image formation face, but it is a very difficult operation to align an optical axis of the feeble light therewith. On the other hand, in the avalanche photodiode, the light-intercepting face is as relatively small as about 200 to 500 μm , so that it is not easily influenced by the stray light. However, also in this case, it is necessary to align the optical axis, so that a measuring operation becomes complex.--

Please replace the paragraph beginning at page 3, line 14, with the following rewritten paragraph:

--That is, in the present invention, there has been realized a light probe microscope having a probe capable of generating light field locally existing in a tip portion, probe position detecting means for controlling a distance between a tip of the probe and a sample to an adjoining

distance, tremor or oscillating means, and control means, scan means for two-dimensionally scanning the probe on a sample surface, a light source for generating the locally existing light field, an optical system for converging a light radiated from the sample surface adjoining the probe tip, and data collecting means, characterized in that a two-dimensional image of the sample surface is obtained in real time by two-dimensional image sensor, and a two-dimensional light image is extracted simultaneously with a shape image by means of obtaining a signal intensity of an optional detection region in the two-dimensional image by picture signal processing means.--

Please replace the paragraph beginning at page 4, line 6, with the following rewritten paragraph:

--Further, it becomes possible to selectively obtain a light signal of specified wavelength by disposing a spectroscope in a front stage of the two-dimensional image sensor. Besides, by means of constructing the converging optical system with an optical system containing a polarizer and a mirror, different polarization components can be made to form images in separate positions on the two-dimensional image sensor, and either polarization component can be selectively detected. Similarly, by constructing the converging optical

system by an optical system containing a dichroic mirror and another mirror, different wavelength components can be made to form images in separate positions on the two-dimensional image sensor, and either wavelength component can be selectively detected. Here, a plurality of the detections region are simultaneously set and plural light images can be simultaneously obtained. By this, it is made possible to observe plural light images without using plural detectors.--

Please replace the paragraph beginning at page 5, line 4, with the following rewritten paragraph:

--Incidentally, in the picture signal processing means, signal processing is performed by means of digitizing a video signal, calculating a light intensity of the detection region, and transmitting it to the data collecting means as a digital value intact or after being converted into an analog value.--

Please replace the paragraph beginning at page 5, line 14, with the following rewritten paragraph:

--Incidentally, according to knowledge of the present inventor, there is an example in which the two-dimensional image sensor is utilized as observing means in order to examine a scattered state of the light from the

probe, but there is no example in which it is used as a light detector in a probe scanning time.--

Please replace the paragraph beginning at page 6, line 21, with the following rewritten paragraph:

--Hereunder, an embodiment of the present invention with reference to the attached drawings.--

Please replace the paragraph beginning at page 6, line 23, with the following rewritten paragraph:

--Fig. 1 shows one constitutional diagram of a light probe microscope of the present invention. In Fig. 1, it has a probe 11 having a light field locally existing in the vicinity of a tip portion thereof, probe position detecting means 12 for detecting a distance between a tip of the probe 11 and a sample to an adjoining distance, tremor or oscillating means 13 and control means 14 for controlling the distance between the probe tip 11 and the sample, scan means 15 for two-dimensionally scanning the probe on a sample surface, a light source 16 for generating the light field locally existing in the vicinity of the probe tip, an optical system 17 for converging a light radiated from a sample 21 surfaces adjoining a probe 11 tip, and data collecting means 18, and further has a two-dimensional image sensor 19, and

picture signal processing means 20. Here, a two-dimensional image on the sample 21 surface is obtained in real time by the two-dimensional image sensor 19, and it is made possible to optionally obtain a signal strength of a detection region in the two-dimensional image by the picture signal processing means 20. Concretely, in case that a tip of the probe 11 is adjacent to the surface of the sample 21, the scattered light generated between the probe and the sample is observed as such a spot-like bright point 31 shown in Fig. 2A on the two-dimensional image sensor 19 placed in an image formation face. Here, by designating a range 32 (Fig. 2B) surrounding the pixels of a portion of the bright point 31 to thereby obtain a brightness of this portion in real time and by transferring it to the data collecting means 18, a data of a light intensity can be obtained simultaneously with a shape information, so that there can be realized a light probe microscope for simultaneously observing the shape picture and the two-dimensional light picture.--

Please replace the paragraph beginning at page 8, line 3, with the following rewritten paragraph:

--In this manner, by designating a measuring region in agreement with the bright point, it is possible to eliminate the problem in which excessive stray light is

detected by a detector having a light-intercepting face that is large with respect to the size of the bright point, and the problem of the optical axis alignment when a detector having a small light-intercepting face in the order of the bright point is used. Particularly, in case of a micro light cantilever using a micro processing technique, it follows that an excited light is directly introduced from a back side of the micro aperture, but in this constitution there is a case that the light leaks from a side face of the cantilever, and a system of the present invention is particularly useful in a point that only the light of the aperture portion is detected.--

Please replace the paragraph beginning at page 9, line 23, with the following rewritten paragraph:

--Particularly, as shown in Figs. 4A and 4B, in an observation of the spectrum, it is possible to simultaneously obtain plural light pictures by simultaneously setting plural detection regions of the spectrum. In Fig. 4A, there is shown a spectrum band 33 and, in Fig. 4B, there are shown designating ranges 34, 35, 36 surrounding a part of the spectrum band.--

Please replace the paragraph beginning at page 10, line 4, with the following rewritten paragraph:

--By setting the detection region for each of plural different wavelength components in this manner, it is possible to obtain a light picture of each different wavelength component. By means of varying the selected wavelength width in a wavelength direction by continuously narrowing it, it is possible to obtain a light picture for every fine wavelength component, and it is also possible, on the basis of the light picture for every wavelength component, to perform extraction of a spectral spectrum in an optional measuring point in a scanning region. By changing a size of the region of the measuring point for the extraction, it is also possible to adjust a face resolving power in the sample face of the spectrum information, an S/N ratio of the spectrum itself, and the like.--

IN THE CLAIMS:

Please amend claims 1-26 as follows:

1. (Amended) A light probe microscope comprising:
a probe having a tip portion and being capable of generating a light field in a vicinity of the tip portion;